

CLAIMS

1. A liquid crystal television receiver which corrects optical response characteristics of a liquid crystal panel by
5 subjecting image data supplied to the liquid crystal display panel to enhancing conversion at least in accordance with image data of a directly previous vertical period and image data of a current vertical period,

10 the liquid crystal television receiver being capable of reproducing images based on image data of more than one broadcasting standard,

the liquid crystal television receiver comprising:

15 signal type detection means for detecting whether input image data is a video signal of a first broadcasting standard or a video signal of a second broadcasting standard, the video signal of the first broadcasting standard being different, in terms of a vertical frequency, from the video signal of the second broadcasting standard; and

20 enhancing conversion means for subjecting the input image data to enhancing conversion, in such a manner as to cause the liquid crystal panel to have a transmittance indicated by the input image data, within a predetermined period of time,

25 in accordance with a result of detection by the signal type detection means, a degree of the enhancing conversion of

the image data by the enhancing conversion means being varied.

2. The liquid crystal television receiver as defined in
5 claim 1, further comprising a table memory that stores an
enhancing conversion parameter specified by the image data
of the current vertical period and the image data of the
directly previous vertical period,

the enhancing conversion means including:

10 an operation section that performs an operation on the
image data so as to enhance the image data, using the
enhancing conversion parameter; and

a multiplying section that multiplies output data of the
operation section by a coefficient corresponding to the result
15 of the detection by the signal type detection means.

3. The liquid crystal television receiver as defined in
claim 2, wherein, the coefficient in a case where the input
image data is the video signal of the second broadcasting
20 standard is smaller than the coefficient in a case where the
input image data is the video signal of the first broadcasting
standard.

4. The liquid crystal television receiver as defined in
25 claim 1, further comprising:

a first table memory that stores an enhancing conversion parameter specified by the image data of the current vertical period and the image data of the directly previous vertical period, the first table memory being referred to when the input image data is the video signal of the first broadcasting standard; and

a second table memory that stores an enhancing conversion parameter specified by the image data of the current vertical period and the image data of the directly previous vertical period, the second table memory being referred to when the input image data is the video signal of the second broadcasting standard,

the enhancing conversion means including an operation section that performs, using the enhancing conversion parameter read out from the first or second table memory in accordance with the result of the detection by the signal type detection means, an operation on the image data so as to enhance the image data.

5. The liquid crystal television receiver as defined in claim 4, wherein, the enhancing conversion parameter in a case where the input image data is the video signal of the second broadcasting standard is smaller than the enhancing conversion parameter in a case where the input image data is the video signal of the first broadcasting standard.

6. The liquid crystal television receiver as defined in claim 1, further comprising:

temperature detection means for detecting a temperature
5 in the liquid crystal television receiver,

the enhancing conversion means varying the degree of the enhancing conversion of the image data, in accordance with a result of detection by the temperature detection means.

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7. The liquid crystal television receiver as defined in claim 6, further comprising a table memory that stores an enhancing conversion parameter specified by the image data of the directly previous vertical period and the image data of
15 the current vertical period,

the enhancing conversion means including:

an operation section that performs an operation on the image data so as to enhance the image data, using the enhancing conversion parameter; and

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a multiplying section that multiplies output data of the operation section by a coefficient corresponding to the result of the detection by the signal type detection means and the result of the detection by the temperature detection means.

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8. The liquid crystal television receiver as defined in

claim 6, further comprising:

a first table memory that stores an enhancing conversion parameter specified by the image data of the current vertical period and the image data of the directly previous vertical period, the first table memory being referred to when the input image data is the video signal of the first broadcasting standard; and

a second table memory that stores an enhancing conversion parameter specified by the image data of the current vertical period and the image data of the directly previous vertical period, the second table memory being referred to when the input image data is the video signal of the second broadcasting standard,

the enhancing conversion means including:

an operation section that performs, using the enhancing conversion parameter read out from the first or second table memory in accordance with the result of the detection by the signal type detection means, an operation on the image data so as to enhance the image data; and

a multiplying section that multiplies output data of the operation section by a coefficient corresponding to the result of the detection by the temperature detection means.

9. The liquid crystal television receiver as defined in claim 6, further comprising:

first table memories that store enhancing conversion parameters that correspond to respective temperatures in the liquid crystal television receiver and are specified by the image data of the current vertical period and the image data of the directly previous vertical period, the first table memories being referred to when the input image data is the video signal of the first broadcasting standard; and

second table memories that store enhancing conversion parameters that correspond to respective temperatures in the liquid crystal television receiver and are specified by the image data of the current vertical period and the image data of the directly previous vertical period, the second table memories being referred to when the input image data is the video signal of the second broadcasting standard,

the enhancing conversion means including an operation section that performs, using the enhancing conversion parameter read out from one of the first and second table memories in accordance with the result of the detection by the signal type detection means and the result of the detection by the temperature detection means, an operation on the image data so as to enhance the image data.

10. The liquid crystal television receiver as defined in claim 6, further comprising a table memory that stores enhancing conversion parameters that correspond to

respective temperatures in the liquid crystal television receiver and are specified by the image data of the current vertical period and the image data of the directly previous vertical period,

5 the enhancing conversion means including an operation section that performs, using the enhancing conversion parameter read out from the table memory, an operation on the image data so as to enhance the image data, in accordance with a result of comparison between (i) a
10 switching temperature determined by the result of the detection by the signal type detection means and (ii) the result of the detection by the temperature detection means.

11. The liquid crystal television receiver as defined in
15 claim 10, further comprising:

 a control means that controls switching and selection of the enhancing conversion parameters,

 the control means including:

 an operation section that performs, on temperature data
20 detected by the temperature detection means, a predetermined operation corresponding to each signal type of the input image data;

 a threshold discriminating section that compares the temperature data, which has been subjected to the operation
25 by the operation section, with predetermined threshold

temperature data; and

a control signal output section that generates a switching control signal with which the enhancing conversion parameters are switched and controlled, in accordance with a result of comparison by the threshold discriminating section.

12. The liquid crystal television receiver as defined in claim 10, further comprising

control means that controls switching and selection of the enhancing conversion parameters,

the control means including:

a threshold discriminating section that compares the temperature data detected by the temperature detection means with predetermined temperature data corresponding to each signal type of the input image data; and

a control signal output section that generates a switching control signal with which the enhancing conversion parameters are switched and controlled in accordance with a result of comparison by the threshold discriminating section.

13. A liquid crystal display control method for correcting optical response characteristics of a liquid crystal display panel, by subjecting image data supplied to the liquid crystal display panel to enhancing conversion at least in accordance with image data of a directly previous vertical period and

image data of a current vertical period,

the liquid crystal panel being capable of reproducing images based on image data of more than one broadcasting standard,

5 the method comprising the steps of:

(i) detecting whether a signal type of input image data is a video signal of a first broadcasting standard or a video signal of a second broadcasting standard, the video signal of the first broadcasting standard being different, in terms of a vertical frequency, from the video signal of the second broadcasting; and

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(ii) subjecting the image data to the enhancing conversion, in such a manner as to cause the liquid crystal panel to have a transmittance indicated by the image data, within a predetermined period of time,

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in accordance with a result of detection of the signal type, a degree of the enhancing conversion of the image data being varied.

20 14. The liquid crystal display control method as defined in claim 13, further comprising the steps of:

(iii) referring to a table memory that stores an enhancing conversion parameter specified by the image data of the directly previous vertical period and the image data of the current vertical period;

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(iv) performing an operation on the image data so as to enhance the image data, using the enhancing conversion parameter; and

(v) multiplying output data as a result of the step (iv) by a coefficient corresponding to the signal type detected in the step (i).

15. The liquid crystal display control method as defined in claim 13, further comprising the steps of:

(iii) referring to a first table memory that stores an enhancing conversion parameter specified by the image data of the directly previous vertical period and the image data of the current vertical period, the first table memory being referred to in a case where the input image data is the video signal of the first broadcasting standard;

(iv) referring to a second table memory that stores an enhancing conversion parameter specified by the image data of the directly previous vertical period and the image data of the current vertical period, the second table memory being referred to in a case where the input image data is the video signal of the second broadcasting standard; and

(v) performing an operation on the image data so as to enhance the image data, using the enhancing conversion parameter read out from the first or second table memory in accordance with the signal type detected in the step (i).

16. The liquid crystal display control method as defined in claim 13, further comprising the steps of:

(iii) detecting a temperature in an apparatus; and

5 (iv) varying the degree of the enhancing conversion on the image data, in accordance with the temperature detected in the step (iii).

10 17. The liquid crystal display control method as defined in claim 16, further comprising the steps of:

(v) referring to a table memory that stores an enhancing conversion parameter specified by the image data of the directly previous vertical period and the image data of the current vertical period;

15 (vi) performing an operation on the image data so as to enhance the image data, using the enhancing conversion parameter; and

(vii) multiplying output data as a result of the step (vi) by a coefficient corresponding to the signal type detected in the step (i) and the temperature detected in the step (iii).
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18. The liquid crystal display control method as defined in claim 16, further comprising the steps of:

25 (v) referring to a first table memory that stores an enhancing conversion parameter specified by the image data

of the directly previous vertical period and the image data of the current vertical period, the first table memory being referred to in a case where the input image data is the video signal of the first broadcasting standard;

5 (vi) referring to a second table memory that stores an enhancing conversion parameter specified by the image data of the directly previous vertical period and the image data of the current vertical period, the second table memory being referred to in a case where the input image data is the video
10 signal of the second broadcasting standard;

 (vii) performing an operation on the image data so as to enhance the image data, using the enhancing conversion parameter read out from the first or second table memory in accordance with the signal type detected in the step (i); and

15 (viii) multiplying output data as a result of the step (vii) by a coefficient corresponding to each temperature detected in the step (iii).

19. The liquid crystal display control method as defined
20 in claim 16, further comprising the steps of:

 (v) referring to first table memories that store enhancing conversion parameters that correspond to respective temperatures in the apparatus and are specified by the image data of the current vertical period and the image data of the
25 directly previous vertical period, the first table memories

being referred to in a case where the input image data is the video signal of the first broadcasting standard;

(vi) referring to second table memories that store enhancing conversion parameters that correspond to
5 respective temperatures in the apparatus and are specified by the image data of the current vertical period and the image data of the directly previous vertical period, the second table memories being referred to in a case where the input image data is the video signal of the second broadcasting standard;
10 and

(vii) in accordance with the signal type detected in the step (i) and the temperature detected in the step (iii), performing an operation on the image data so as to enhance the image data, using the enhancing conversion parameter
15 read out from one of the first and second table memories.

20. The liquid crystal display control method as defined in claim 16, further comprising the steps of:

(v) referring to table memories that store enhancing
20 conversion parameters that correspond to respective temperatures in the apparatus and are specified by the image data of the directly previous vertical period and the image data of the current vertical period; and

(vi) performing an operation on the image data so as to
25 enhance the image data, using the enhancing conversion

parameter read out from one of the table memories with reference to a result of comparison between a switching temperature determined by the signal type detected in the step (i) and the temperature detected in the step (iii).

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21. The liquid crystal display control method as defined in claim 20, further comprising the steps of:

(vii) performing, on temperature data corresponding to the temperature detected in the step (iii), a predetermined operation corresponding to each signal type of the input image data;

(viii) comparing the temperature after being subjected to the predetermined operation with predetermined threshold temperature data; and

(ix) in accordance with a comparison in the step (viii), generating a switching control signal for switching and controlling the enhancing conversion parameters.

22. The liquid crystal display control method as defined in claim 21, further comprising the steps of:

(vii) comparing temperature data corresponding to the temperature detected in the step (iii) with predetermined threshold temperature data corresponding to each signal type of the input image data; and

(viii) in accordance with a comparison in the step (vii),

generating a switching control signal for switching and controlling the enhancing conversion parameters.

23. A program for a computer that controls a liquid
5 crystal television receiver capable of reproducing images
based on image data of more than one broadcasting standards,
the liquid crystal television receiver correcting optical
response characteristics of a liquid crystal display panel by
performing an enhancing conversion of image data supplied to
10 the liquid crystal display panel, in accordance with image
data of a directly previous vertical period and image data of a
current vertical period, in such a manner as to causing the
liquid crystal panel to have a transmittance specified by the
image data, within a predetermined period of time,
15 the program causing the computer to perform a step of
varying a degree of the enhancing conversion of the image
data, in accordance with a result of detection of whether a
signal type of input image data is a video signal of a first
broadcasting standard or a video signal of a second
20 broadcasting standard, the video signal of the first
broadcasting standard being different, in terms of a vertical
frequency, from the video signal of the second broadcasting.

24. A recording medium recording a program for a
25 computer that controls a liquid crystal television receiver

capable of reproducing images based on image data of more than one broadcasting standards, the liquid crystal television receiver correcting optical response characteristics of a liquid crystal display panel by performing an enhancing conversion of image data supplied to the liquid crystal display panel, in accordance with image data of a directly previous vertical period and image data of a current vertical period, in such a manner as to causing the liquid crystal panel to have a transmittance specified by the image data, within a predetermined period of time,

the program causing the computer to perform a step of varying a degree of the enhancing conversion of the image data, in accordance with a result of detection of whether a signal type of input image data is a video signal of a first broadcasting standard or a video signal of a second broadcasting standard, the video signal of the first broadcasting standard being different, in terms of a vertical frequency, from the video signal of the second broadcasting.